VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a **Major Municipal** permit. Effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The discharge results from the operation of a trickling filter wastewater treatment plant, chlorine disinfection and dechlorination of effluent prior to discharge. This permit action consists of reissuance of the permit for a term of five years with updated boilerplate special conditions (include adding conditions for stormwater associated with industrial activity), and with limitations on pH, biochemical oxygen demand (BOD_5), total suspended solids (TSS) and E. coli. (SIC Code: 4952 - sewage treatment)

1. **Facility Name and Address**:
   Clifton Forge Wastewater Treatment Plant - Town of Clifton Forge
   P. O. Box 268, Clifton Forge, VA 24422

   Location: 100 Mountain View Cemetery Road, Clifton Forge, Virginia

2. **Permit No**. **VA0022772** Expiration Date: September 13, 2009

3. **Operator Contact**: Mr. Brian T. White, Plant Manager (540)862-2503
   Environmental Systems Services, Ltd., Clifton Forge WWTP, P.O. Box 268, Clifton Forge, VA 24422
   Environmental Systems Services, Ltd., 218 N Main St, Culpeper, VA 22701 (800)541-2116
   Owner Contact: Mr. Tracey Shiflett, Town Manager (540)862-2500
   Town of Clifton Forge, P. O. Box 631, Clifton Forge, VA 24422

4. **Application Complete Date**: March 16, 2009
   Permit Drafted By: Susan K. Edwards Date: July 29, 2009
   DEQ Regional Office: West Central Regional Office
   Reviewed By: Kip D. Foster Date: August 6, 2009

   Public Comment Period Dates: August 12 through September 11, 2009

5. **Receiving Stream Name**: Jackson River (River mile: 3.46)
   Basin: James River Sub-basin: Jackson River Section: 12
   Class: IV, Mountainous Zone Waters Special Standards: none

   7-Day, 10-Year Low Flow (7Q10): 136.5 MGD 7Q10 High Flow months: Jan. - May
   1-Day, 10-Year Low Flow (1Q10): 137 MGD 1Q10 High Flow months: Jan. - May
   30-Day, 5-Year Low Flow (30Q5): 141.5 MGD Harmonic Mean Flow: 245 MGD
   30-Day, 10-Year Low Flow (30Q10): 137 MGD
   Tidal: No On 303(d) list: Yes

   Attachment A contains flow frequency determination memorandums, 2009 and 1998.

6. **Operator License Requirements**: Class II

7. **Reliability Class**: I

8. **Permit Characterization**:
   ( ) Private ( ) Federal ( ) State (**X**) POTW ( ) PVOTW
   ( ) Possible Interstate Effect ( ) Interim Limits in Other Document

9. **Wastewater Treatment System**: **Attachment A** contains a copy of the treatment plant schematic.

Outfall	Discharge Sources	Treatment	Design Flow
001	Regional separate sewage collection system of domestic wastewater from the town & portion of Alleghany County. Approx population of 7400 & commercial businesses.	Optional flow equalization, aerated pretreatment headworks, grit removal & screening, primary clarifier, primary pump station, twin fixed media stacked trickling filter towers, twin secondary clarifiers, twin chlorine contact tanks using chlorine gas, sulfur dioxide dechlorination, flow measurement & effluent sampling.	2.0 million gallons per day
	Treatment plant stormwater	"No Exposure Certificate" submitted	NA

10. **Sewage Sludge Use or Disposal**: Wasted sludge is pumped to one of two aerobic digesters for dewatering/thickening, polymer is added and the sludge spread on covered drying beds to thicken for disposal. The sludge is currently hauled by Thompson Trucking and disposed of at the Amelia County Landfill. A copy of the VPDES Sewage Sludge Permit Application form is included in the permit application package.

11. **Discharge Location Description**: The treatment plant is on the west side of Mountain View Cemetery on the south side of Virginia Route 60, in the Town of Clifton Forge, Alleghany County. The discharge itself is piped from the plant under the railroad tracks along the Jackson River to outfall at the river. A portion of the USGS topographic map, which indicates the discharge location and other items of interest is included in **Attachment A**. There are no significant (large) dischargers to the receiving stream or water intakes within the immediate area.

    Name of Topo: Clifton Forge (159D) Discharge: N 37°48'43", E 79°49'00"

12. **Material Storage**: Chlorine gas for disinfection and sulfur dioxide for dechlorination are stored in separate buildings. Polymer for sludge thickening is stored in the digester building. No materials are stored uncovered in a location that exposes them to rainfall, which might present a risk of reaching State waters. A VPDES Stormwater No Exposure Certificate has been submitted by the facility regarding the exposure of materials to stormwater. See **Attachment A** for a copy of the Certificate.

13. **Ambient Water Quality Information**: The receiving water body is the Jackson River which is within Section 12 of the James River basin as listed in the State Water Control Board's Water Quality Standards, River Basin Section Tables (9 VAC 25-260-430). The receiving stream is Class IV - Mountainous Zones Water and no special standards designated. The outfall is at river mile 3.46.

    Flow of the receiving stream includes the influence of controlled water releases from the Gathright Dam. Flow monitoring data for gage station #02016500 at Lick Run has been evaluated based on data from 1980 forward rather than the full period of record, starting in 1925. The Gathright Dam on Lake Moomaw has influenced the flow rates of the Jackson River since December of 1979. The same techniques used to calculate the critical flows in the DEQ Office of Water Quality Assessments and Planning Flow Frequency Determination Memorandum dated October 29, 1998 were used with the reevaluated flows at gage station at Lick Run in an updated flow memorandum. During the reevaluated period, 1980 - 2003, there have been two periods when during critical low flow conditions the Corps of Engineers did not release the minimum rates due to drought conditions. These two summer curtailments have a much greater influence on the minimum flow statistics of the Jackson River as they represent drought operation rather than what would be considered as design "low flow" conditions. It would not be reasonably expected that releases from Gathright would be curtailed once every 10 years. Therefore, the flow frequencies from the 1998 Memorandum have been used in this reissuance. It is expected with additional years of monitoring at the Lick Run gage station the site will put in better perspective the drought year reduced releases from Gathright Dam. Copies of the October 29, 1998 and February 2, 2009, Flow Frequency Memos are provided in **Attachment A**.

    The Clifton Forge WWTP falls into the James River basin/Jackson River watershed (VAW-I09R) (Jackson River Lower 1). In the 2008 305(b)/303(d) Water Quality Assessment Integrated Report (approved by EPA on 12/18/08), this portion of the VAW-I09R waterbody is listed (5A) for benthic impairment for failure to meet the General Standard (Benthic). The benthic impairment runs from the discharge of MeadWestvaco to the confluence of the Jackson River with the Cowpasture River to form the James River for a total of 24.19 river miles. The impairments caused the segment to fail to support the Clean Water Act aquatic life use goals. The segment TMDL is scheduled for development in 2010. The 303(d) List Fact Sheet for the segment identifies the possible sources of the impairment as urban non-point source runoff as well as industrial and municipal point sources. The 2008 Impaired Waters Fact Sheet for the segment is provided in **Attachment A**.

The Jackson and James Rivers drain to the Chesapeake Bay. Waste Load Allocations [WLAs] for total nitrogen [TN] and total phosphorous [TP] have been promulgated by 9VAC 25-720 et. seq. to protect the Bay from nutrient enrichment. This facility has Total Nitrogen and Total Phosphorus calendar year load limits associated with this outfall included in the current Registration List of the General VPDES Watershed Permit Regulations for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia (9 VAC 25-820-10 et seq.). This facility is registered as VAN040064 under the VPDES General Permit. A footnote to this effect is included on the limitations page of the reissued permit.

DEQ stream monitoring station 2-JKS006.67 on the Jackson River is 3.2 miles upstream of the discharge point from the Clifton Forge WWTP. Monitoring station 2-JKS006.67 is on the Jackson River at the Low Water Bridge near Dabney Lancaster Community College. STORET monitoring data from this station is used as representative of receiving water pH, temperature and hardness for water quality. pH, temperature and hardness data were taken from the data collected between June 1993 and May 2003. This information is the same as used in the 2004 reissuance. No additional data has been added to the STORET database during this permit term. A summary of the data is provided in **Attachment A**.

Threatened and endangered species - The reissuance of this permit does not involve an increase in discharge flows and the permitted facility is not on the list of sites requesting to be reviewed by DGIF, DCR and USFWS. In accordance with DEQ Guidance Memo 07-2007 screening of the three indicated data sources for threatened and endangered species. It is not believed that the discharge impacts known aquatic threatened and endangered species.

14. **Antidegradation Review and Comments**: Tier I **X** Tier II ___ Tier III ___

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier I, existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier II water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier II waters is not allowed without an evaluation of the economic and social impacts. Tier III water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters. The limitations in this permit were developed in accordance with § 303(d)(4) of the Clean Water Act.

The antidegradation review begins with Tier determination. The receiving waterbody, the Jackson River, at the point of discharge remains on the list of impaired waters. The outfall 001 discharge is existing and there is no indication of any proposed increase in the discharge of pollutants via this outfall. As the facility is not proposing any increase in the loading of any pollutants over historical levels, permit limits are in compliance with antidegradation requirements set forth in the Water Quality Standard Regulation, 9 VAC 25-260-30. The antidegradation review and associated effluent limits analyses, below, were conducted as described in Guidance Memorandum 00-2011, dated August 24, 2000, and comply with the antidegradation policy contained in Virginia's Water Quality Standards set forth in 9 VAC 25-260-30.

15. **Site Inspection**: July 15, 2009 Performed by: Susan Edwards
Attachment A contains a copy of the site visit memorandum.

16 **Effluent Screening and Limitation Development**: In accordance with the 2004 reissuance of the VPDES permit, the effluent has been monitored for compliance with flow, pH, BOD_5, TSS and total residual chlorine. Effluent nitrogen and phosphorus levels are monitored under the VPDES General Permit for Discharges to the Chesapeake Bay in accordance with DEQ GM 04-2017. Effluent limitations and monitoring requirements are based on Federal Effluent Guidelines 40 CFR 133, Virginia's water quality standards (9 VAC 25-260-5 et seq.) (specifically, DEQ Guidance Memorandum 00-2011), the previous permit, the VPDES Permit Manual and best engineering judgement.

a. **Effluent Screening** - A review of effluent data from the last three-year period as submitted on Discharge Monitoring Reports indicate that the average daily discharge is reported below the design/permitted flow for the plant of 2.0 MGD most of the time. The average flow exceeded the design capacity once during the three-year review period, as reported on the April 2007 DMR even with the equalization tanks. This is a noteworthy improvement over the previous reissuance when average flows regularly exceeded the design capacity. In June of 2006 an extremely high flow value was estimated by plant operators when the area received more than 7 inches of rainfall in a two-day period. During this very unusual event the effluent flume for measuring flows was flooded and the flow was diverted from the plant to avoid overflow of the primary clarifiers or the equalization tanks. No similar event has occurred at the plant. All effluent parameters limited by the permit are in compliance. See **Attachment B** of a summary of monitoring data.

b. **Application Data** - Effluent testing data submitted as part of the application was reviewed to determine if there is "suitable data" for analysis. Suitable data is that which is quantifiable and for which there are water quality standards in the state. The evaluation is of parameters that are not currently limited in this permit to assess the need to include a limit as part of this reissuance.

   Flow rate, pH, temperature, BOD_5, fecal coliform and total suspended solids are reported on Table A.12 of EPA Form 2A. All of these parameters are monitored in the permit except for temperature and fecal coliform. Temperature is not seen as a problem with this discharger due to the nature of the effluent. But the data is useful in water quality based effluent limit development. Fecal coliform is not the bacterial water quality indicator species in Virginia.

   Ammonia, total residual chlorine (TRC), dissolved oxygen, total kjeldahl nitrogen (TKN), nitrate plus nitrite nitrogen, oil and grease, phosphorus and total dissolved solids data are reported on Table B.6 of EPA Form 2A of the application. Of these parameters ammonia is used to validate the need for an ammonia limit for the discharge. Dissolved oxygen is not currently limited but is measured daily as part of plant operations. TRC is limited and will continue to be limited as a water quality based toxic. The TRC data submitted demonstrates compliance. Three oil and grease results and three total dissolved solids values were reported. There are currently no Virginia Water Quality Criteria for surface waters in 9 VAC 25-260-140 for these parameters and therefore no limit evaluation can be performed. Total phosphorus and nitrogen compounds are now monitored and limited under the VPDES General Permit for Nutrients in the Chesapeake Bay Watershed (9 VAC 25-820) that became effective on Jan. 1, 2007. The watershed nutrient monitoring and trading program removes from the individual permit the monitoring requirements and limits for nutrients. The VPDES General Permit for coverage for Clifton Forge WWTP is VAN040064. The Watershed Permit will expire Dec. 31, 2011. No further evaluation of phosphorus & nitrogen compounds is included in this evaluation.

   Part D of the EPA Form 2A application included expanded effluent testing as a major municipal discharge (design capacity greater than 1.0 MGD). A waiver was granted for two rather than three samples as this level of effluent screening in conjunction with the reissuance was considered adequate to assess the presence of any of these parameters. Results for most parameters were below the required detection level. In the metals section, copper and zinc were detected. In the volatile organic compounds section, toluene was detected but the WQS for this parameter is only a human health standard. All other parameters were not present above the ML/MDL.

c. **Whole Effluent Toxicity** - the 2004 permit required annual acute and chronic testing of the effluent of outfall 001 using *Pimephales promelas* (fathead minnow) as the most sensitive species. The acute test is a 48-hour static test; the chronic test is a 7-day larval survival and growth test in accordance with Guidance Memo 00-2012. **Attachment B** includes a memorandum summarizing the results. The effluent does not demonstrated toxicity.

d. **Mixing Zone** - The current agency mixing model, MIX version 2.1.0, has been run to confirm what percentage of the receiving stream flow can be used in the WLA calculations. A copy of the printouts from the software runs are in **Attachment B**.

e. **Effluent Limitations for Conventional Pollutants**

Flow - The treatment plant has a design capacity 2.0 MGD. The flow from the treatment plant is not limited but is reported monthly from continuous monitoring.

pH - Limitations for pH are **6.0 S.U. minimum** and **9.0 S.U. maximum** according to the WQS 9 VAC 25-260-50 as a Class IV, Mountainous Zones Waters and Federal Effluent Guidelines' secondary treatment requirements (40 CFR 133). Monitoring is once per day by grab sample.

Biological Oxygen Demand (BOD_5) - Secondary treatment standards as mandated by the federal technology-based guidelines (40 CR Part 133.102) are applicable to the BOD_5 limit. Effluent limits of **30 mg/l** and 227 kg/day as a monthly average and **45 mg/l** and 340 kg/day as a weekly average have been required for BOD_5. Monitoring of BOD_5 is at five days per week by 24-hour composite sample. In addition, the facility is to meet a minimum technology based requirement for 85% removal efficiency for BOD_5.

Total Suspended Solid (TSS) - Secondary treatment standards as mandated by the federal technology-based guidelines (40 CR Part 133.102) are applicable to the TSS limit. Effluent limits of **30 mg/l** and 227 kg/day as a monthly average and **45 mg/l** and 340 kg/day as a weekly average have been required for TSS. Monitoring of TSS is at five days per week by 24-hour composite sample. In addition, the facility is to meet a minimum technology based requirement for 85% removal efficiency for TSS.

Bacteria *E. coli.* - The limit is 126 n/100 mL (geometric mean). Monitoring is two times per month and at least seven days apart. Samples are to be collected between 10 AM and 4 PM. The limit is based on the current bacteria water quality criteria, geometric mean of 126 n/100 mL (9 VAC 25-260-170 B). Previous permits monitored disinfection of treated wastewater solely through minimum total residual chlorine limits, with samples collected immediately after the chlorine contact tank (prior to dechlorination, if present). In addition, weekly and monthly limits for total residual chlorine after dechlorination are included as toxic parameters. The monitoring frequency (twice per month) is less frequent than that recommended in Permit Manual Section MN-2 (5 days a week). Bimonthly *E. coli* monitoring is justified by chlorine monitoring requirements and a previous demonstration of disinfection effectiveness as part of the Permit 2005 reissuance. This practice was implemented as agreed upon by the DEQ Water Permit Managers on their Dec. 20, 2007 conference call as recorded in minutes dated Jan. 22, 2008.

f. **Effluent Limitations for Toxic Pollutants**

A Water Quality Wasteload Allocation (WLA) spreadsheet (MSTRANTI draft k) was prepared with the receiving stream critical flows together with hardness, pH and temperature data for the effluent and the receiving stream. As discussed earlier the receiving stream STORET data has not been added to since the data used in the 2004 reissuance. As part of the 2004 reissuance effluent records for pH and temperature for a year were used as representative. The hardness values were taken from WET testing water quality measures of effluent during the previous term. There have not been any substantive chances to the plant that would cause the recalculation of the pH, temperature and hardness values from those used in 2004 at this reissuance. Refer to **Attachment B** for the STORET & effluent data, WLA spreadsheet and effluent limit calculations.

Ammonia as Nitrogen - The need for an ammonia limit was reevaluated at the 2005 reissuance based on agency Guidance Memo #00-2011 and the 2003 changes in the WQS. The chronic ammonia WLA uses the 30Q10 receiving stream flow. WLA calculations use mixed effluent and receiving stream pH and temperature data as indicated on the ammonia WLA spreadsheets of **Attachment B**. Acute and chronic WLA values of 88 mg/l and 52 mg/l were input into the agency Statistically Derived Permit Limits version 2.0.4 (STATS) statistical software. In accordance with GM 00-2011, in order to force a limit calculation for ammonia, a single datum of 9 mg/l was used for ammonia. The evaluation indicates that limits for ammonia are not needed. As the critical flows at the point of discharge have not changed there is no need to further evaluate the need for an ammonia limit.

Total Residual Chlorine (TRC) - The treatment plant uses chlorination as the disinfection method. In addition to requirements for bacterial disinfection, chlorine is limited as a toxic. Acute and chronic WLAs from the spreadsheet, were input into the STATS software. In accordance with GM 00-2011, in order to force a limit calculation for total residual chlorine, a single datum of 20,000 µg/l was used for chlorine. A chlorine limit of **107** m**g/l** as a **maximum weekly average** and **89** m**g/l** as a **monthly average** are required. Analysis is to be at least four/day at four-hour intervals by grab sample. The Special Condition for internal monitoring for disinfection is included in Part I of the permit. The number of excursions allowed within Part I.B.2. of the permit is based on the minimum sampling frequency of 4-times/day sampling and 30 days per month.

Copper & Zinc - In Part D of EPA application Form 2A, copper and zinc were detected above the ML/MDL. Two total recoverable metals data points were reported for these parameters above the detection level - copper at 0.008 & 0.011 mg/l and zinc at 0.023 & 0.028 mg/l. The copper and zinc were analyzed and reported as total metals data. Virginia's water quality standards are in terms of dissolved metals. Total metals data cannot be used to set effluent limits but can be used to determine that no limit is needed. The acute & chronic wasteload allocations for both copper & zinc were used in the agency's STATS software to assess the statistical need for a limit based on the pairs of data points. The STATS evaluation indicate there is no need for a limit for either parameter. Output results are in **Attachment B**.

Other Toxics - No other suitable toxics data is available for evaluation.

g. **Nutrient Monitoring** - The Clifton Forge Waste Water Treatment Plant is covered under the Watershed Permit for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed (9 VAC 25-820) that became effective on Jan. 1, 2007. The watershed nutrient monitoring and trading program removes from the individual permit the monitoring requirements and limits for nutrients. The VPDES General Permit for coverage for Clifton Forge WWTP is VAN040064. The Watershed Permit will expire Dec. 31, 2011.

Table II - Basis for Effluent Limitations

PARAMETER	BASIS
Flow	NA – monitoring only
pH	1 (40 CFR 133) & 2 (9 VAC 25-260-50)
BOD_5	1 – Secondary Treatment (40 CFR 133)
Total Suspended Solids	1 - Secondary Treatment (40 CFR 133)
Total Residual Chlorine	2 – WQS toxics (9 VAC 25-260-140)
E. coli	2 - WQS bacteria (9 VAC 25-260-170)

1. Federal Effluent guidelines – cite CFR
2. Water Quality Based Limits: - show calculations or cite WQM plan reference
3. Best Engineering Judgment: - provide narrative rationale
4. Other (e.g. wasteload allocation model): - specify & document with model output or WLA from TMDL or basin plan

17. **Basis for Sludge Use and Disposal Requirements**: A VPDES Sewage Sludge Application Form was submitted in the application package. The dewatered sludge is transported on an as-needed basis by a contract hauler for disposal in a landfill. Wasted sludge is pumped to one of two aerobic digesters for dewatering/thickening, polymer is added and the sludge spread on covered drying beds to thicken for disposal. The sludge is currently hauled by Thompson Trucking and disposed of at the Amelia County Landfill. A Sludge Reopener special condition is included in the event regulations regarding sludge change to affect this type of operation.

18. **Antibacksliding Statement**: All limitations are as stringent as the previous permit. Accordingly the anti-backsliding provisions of 9 VAC 25-31-220 L are satisfied.

19. **Compliance Schedule**: (9 VAC 25-31-250) There are no new or lower limits included in the reissuance of the permit. Therefore, there is no compliance schedule needed.

20. **Special Conditions:** A brief rationale for each special condition contained in the permit is given below.

a. **Additional Total Residual Chlorine Limitations and Monitoring Requirements** (Part I.B) - Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790, bacteria standards; other waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.

b. **95% Capacity Reopener** (Part I.C.1.) - Rationale: Required by 9 VAC 25-31-200 B2 for all POTW and PVOTW permits.

c. **Indirect Dischargers** (Part I.C.2) - Rationale Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 1 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

d. **CTC, CTO Requirement** (Part I.C.3) - Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790.

e. **O&M Manual Requirement** (Part I.C.4) - Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190 E. At a minimum a letter should be submitted to the Regional office indicating that the current manual is up to date and that the only change is the incorporation of the new VPDES permit with the associated DMR. Should any changes be made at the facility to operations and/or maintenance practices during the term of the permit the approved manual must be updated. The permittee is responsible for operating the facility in accordance with the O&M Manual

f. **Licensed Operator Requirement** (Part I.C.5) - Rationale: Required by the VPDES Permit Regulation, 9 VAC 25-31-200 D and the Code of Virginia § 54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.), require licensure of operators. This Special Condition requires staffing with an operator with a Class II license.

g. **Reliability Class** (Part I.C.6) - Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities. The Reliability Class has been designated as Class I in agreement with the OWE recommendation for the facility.

h. **Water Quality Criteria Reopener** (Part I.C.7) - Rationale: VPDES Permit Regulation, 9 VAC 25-31-220 D requires effluent limitations to be established which will contribute to the attainment or maintenance of water quality criteria.

i. **Sludge Reopener** (Part I.C.8) - Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-220 C 4 for all permits issued to treatment works treating domestic sewage.

j. **Total Maximum Daily Load Reopener** (Part I.C.9) - Rationale: Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition allows the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

k. **Compliance Reporting Under Part I A and B** (Part I.C.10) - Rationale: Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when toxic pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

j. **Sludge Use and Disposal** (Part I.C.11.) - Rationale: VPDES Permit Regulations section 9 VAC 25-31-100 P: 220 B 2; and 420 through 720, and 40 CFR Part 503 require all treatment works treating

domestic sewage to submit information on sludge use and disposal. Technical requirements may be derived from the VPA Permit Regulations, 12 VAC 5-585-10 et seq.

k. **Toxics Management Program** (Biological Monitoring) (Part I.C.12.) - Rationale: VPDES Permit Regulation, 9 VAC 25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act.

l. **Pretreatment Program** (Part I.D.) - Rationale: VPDES Permit Regulations, 9 VAC 25-31-730 through 900, and 40 CFR Part 403 require certain existing and new sources of pollution to meet specified regulations. The wording of the condition is for an existing program that does not have any significant industrial contributors to the collection system.

m. **Conditions Applicable to All VPDES Permits** (Part II) - Rationale: VPDES Permit Regulations, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. **Changes to Permit:**

Table III - Changes to limits from 2003 reissuance

Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Reason for Change	Date
	From	To	From	To		
TRC			128 ug/L	107 ug/L	Re-evaluation of toxic limits.	July 2009
E. coli	none	2/D-month	none	126 n/100 ml	WQS bacteria (9 VAC 25-260-170)	July 2009
Total Nitrogen & Total Phosphorus	1/month	NA	NL	NA	Monitoring now in Chesapeake Bay Watershed General Permit VAN040064	July 2009

Deletions or Modifications to special conditions from the 2004 permit (Conditions referenced by numbering in 2004 permit.) In general the Special Conditions have been updated in wording and renumbered to correspond with the wording and order of the current VPDES Permit Manual.

C.7 Nutrient Enriched Waters Reopener - condition removed as nutrient related conditions are covered under the Chesapeake Bay Watershed General Permit (for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading) (9 VAC 25-820). VPDES General Permit VAN040064.

C.12 Basis of Design and Interim Optimization Plan Reports - schedule of condition related to nutrients discharged from the treatment plant has been met during 2004 permit term. Condition no longer needed.

C.13 Nutrient Reporting Calculations - condition removed with coverage under Chesapeake Bay Watershed General Permit VAN040064.

E. General Storm Water Special Conditions - removed with Town submittal of a No Exposure Certification that there is no exposure of stormwater to site industrial activities that would require the condition.

F. Storm Water Pollution Prevention Plan - removed as noted for special condition E.

Additions to the special conditions from the 2004 permit - No new special conditions have been added to the permit with the reissuance.

22. **Variances/Alternate Limits or Conditions**: A waiver of EPA Form 2A application testing requirements was granted for the third series of the Expanded Effluent Testing Data of Part D and for the second species of the Toxicity Testing of Part E. Two series of testing this existing discharge is believed adequate to indicate the need for additional testing for the listed water quality parameters. Effluent whole effluent toxicity data collected during the current term uses the historically more sensitive species in a long history of WET testing that is adequate for use in the reissuance of this VPDES permit. A waiver was granted for EPA Form 2A application testing requirements for Part A, Conventional and Non Conventional Compounds from fecal coliform testing to *E. coli* testing. The Virginia Water Quality Standard for bacteria is now E. coli rather than Fecal Coliform. In Part B.6 a waiver to test for HEM rather than Oil and Grease was

approved. (EPA Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry.) HEM analysis rather than Oil & Grease is the new non-CFC-113 method of determining the level of Oil & Grease. It is our belief that the granting of these waivers or submittal of alternate parameter data is reasonable. The waivers will not adversely affect this permit reissuance and that the substitute information will provide more suitable information for permit reissuance

A variance to the standard requirement for treatment plants of this size to include Water Quality Standards Monitoring (Attachment A) at least once per term was included. The treatment plant is scheduled to be converted from a discharging wastewater treatment plant to a pump station transferring wastewater to the new Lower Jackson River wastewater treatment plant being built by Alleghany County. There is no compliance schedule associated with the conversion or closure plan included in this permit action as there is no regulatory basis to require the conversion. However, the existing Clifton Forge WWTP has been evaluated for upgrade to remove nutrients

No other variances or alternatives to required permit conditions/limitations are within the permit. No other variances from technology guidelines or water quality standards or from VPDES permit manual guidance are known to be used in the development of this permit.

23. **Regulation of Users**: (9 VAC 25-31-280 B 9) There are no longer any categorical industrial users contributing to the treatment works' collection system. The industrial pretreatment program special condition is included should a significant industrial contributor begin discharge to the plant.

24. **Public Notice Information required by 9 VAC 25-31-280 B**:

All pertinent information is on file and may be inspected, and copied by contacting Susan Edwards at:

Virginia DEQ, West Central Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019

Telephone no. (540)562-6700 or susan.edwards@deq.virginia.gov

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

25. **Additional Comments**:

Previous Board Action - The facility is the subject of a Consent Order regarding on-going flow contributions from infiltration and inflow. The Town continues to make progress on the subject in accordance with the Order.

Staff Comments - The discharge is not controversial. The WCRO Water Permit Support Group notes that the discharge is in conformance with the existing planning document for the area.

Public Comments - No comments were received during the Public Notice.

EPA Commments - E-mail from EPA indicates no comments or objection to the reissuance.

Review of Reduced Monitoring Frequency - Guidance Memos 00-2011 and 98-2005 allows for reduced monitoring at facilities with excellent compliance histories. To qualify for consideration of reduced monitoring, the facility should not have been issued any Warning Letters (WLs), NOVs, or NULEs, or be under any Consent Orders, Consent Decrees, Executive Compliance Agreements, or related enforcement

documents during the past three years. As indicated above, this facility is under a Consent Order that makes the discharge ineligible for reduction of the monitoring frequency.

26. **303(d) List**: The Clifton Forge WWTP falls into the James River basin/Jackson River watershed (VAW-I09R) (Jackson River Lower 1). In the 2008 305(b)/303(d) Water Quality Assessment Integrated Report (approved by EPA on 12/18/08), this portion of the VAW-I09R waterbody is listed (5A) for benthic impairment for failure to meet the General Standard (Benthic). The benthic impairment runs from the discharge of MeadWestvaco to the confluence of the Jackson River with the Cowpasture River to form the James River for a total of 24.19 river miles. The impairments caused the segment to fail to support the Clean Water Act aquatic life use goals. The segment TMDL is scheduled for development in 2010. The 303(d) List Fact Sheet for the segment identifies the possible sources of the impairment as urban non-point source runoff as well as industrial and municipal point sources. The 2008 Impaired Waters Fact Sheet for the segment is provided in **Attachment A**.

VPDES Permit VA0022772
Clifton Forge WWTP
Reissuance September 2009

ATTACHMENT A

1. Flow Frequency Memos of October 29, 1998 and February 2, 2009
2. Schematic of treatment plant from application.
3. Portion of Clifton Forge USGS quadrangle taken from the application
4. No Exposure Certificate submitted by permittee regarding no industrial activity exposed to storm water.
5. The 2008 Impaired Waters Fact Sheet for the James River basin/Jackson River watershed segment VAW-I09R (Jackson River Lower 1).
6. Site visit report of July 17, 2009 (July 15, 2009 visit)
7. STORET data from Station 2-JKS006.67 used for receiving stream hardness, temperature and pH.

NOV 0 RECEIVED

KBS DMMc

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Water Quality Assessments and Planning
629 E. Main Street P.O. Box 10009 Richmond, Virginia 23240

SUBJECT: Flow Frequency Determination
Clifton Forge STP - VA#0022772

TO: Karen Stevens, WCRO

FROM: Paul E. Herman, P.E., WQAP

DATE: October 29, 1998

COPIES: Ron Gregory, Charles Martin, File

This memo supercedes my June 23, 1993 memo to James Scott concerning the subject VPDES permit.

The Clifton Forge STP discharges to the Jackson River in Clifton Forge, VA. Stream flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit.

The USGS has operated continuous record gages on the James River at Lick Run, VA (#02016500) since 1925, and on the Cowpasture River near Clifton Forge, VA (#02016000) since 1925. The Cowpasture River merges with the Jackson River about 3.0 miles downstream of Clifton Forge to form the James River. The Lick Run gage is just below this confluence. The data provided by the Cowpasture gage (flow frequencies and drainage area) was subtracted from the data provided by the Lick Run gage. The resulting values were projected to the discharge point using drainage area proportions. Then, the guaranteed flow release from Gathright Dam was added.

James River at Lick Run, VA (#02016500):

Drainage Area = 1,373 mi^2

1Q10 = 177 cfs	High Flow 1Q10 = 233 cfs
7Q10 = 184 cfs	High Flow 7Q10 = 260 cfs
30Q5 = 219 cfs	HM = 588 cfs

Cowpasture River near Clifton Forge, VA (#02016000):

Drainage Area = 461 mi^2

1Q10 = 52 cfs	High Flow 1Q10 = 82 cfs
7Q10 = 55 cfs	High Flow 7Q10 = 92 cfs
30Q5 = 69 cfs	HM = 191 cfs

James River minus Cowpasture River:

Drainage Area = 912 mi^2

1Q10 = 125 cfs	High Flow 1Q10 = 151 cfs
7Q10 = 129 cfs	High Flow 7Q10 = 168 cfs
30Q5 = 150 cfs	HM = 397 cfs

Projecting the flow frequencies to the Clifton Forge STP on the Jackson River and adding the Gathright releases...

Jackson River at Clifton Forge STP:

Drainage Area = 870 mi^2

1Q10 = 119 cfs + 92 cfs = 211 cfs	= 136.36 MGD
7Q10 = 123 cfs + 89 cfs = 212 cfs	= 137.00 MGD
30Q5 = 143 cfs + 76 cfs = 219 cfs	= 141.55 MGD
High Flow 1Q10 = 144 cfs + 78 cfs = 222 cfs	= 143.47 MGD
High Flow 7Q10 = 160 cfs + 69 cfs = 229 cfs	= 147.99 MGD
HM = 379 cfs + ------ = 379 cfs	= 244.93 MGD

The high flow months are December through May. This analysis does not address any withdrawals, discharges, or springs which may lie between the gage and the discharge point.

If you have any questions concerning this analysis, please let me know.

MEMORANDUM
DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Blue Ridge Regional Office - Roanoke
3019 Peters Creek Road, Roanoke, VA 24019-2738

SUBJECT: Flow Frequency Determination, Clifton Forge WWTP - #VA0022772

TO: Permit reissuance file

FROM: Susan K. Edwards, Environmental Engineer Senior, Water Permitting - WCRO

DATE: February 2, 2009

This memo supercedes the January 9, 2004 memo concerning the subject VPDES permit.

The Clifton Forge WWTP discharges to the Jackson River in Clifton Forge, VA. Stream flow frequencies are required at this site for the purpose of calculating effluent limitations for the VPDES permit.

The USGS has operated continuous record gages on the James River at Lick Run, VA (#02016500) since 1925, and on the Cowpasture River near Clifton Forge, VA (#02016000) since 1925. The monitoring information maintained by DEQ on the gage station #02016500 indicates that the updated information was reevaluated based on data from 1980 forward rather than the full period of record starting in 1925. This change was due to the change in flows due to the influence of the Gathright Dam on Lake Moomaw since December of 1979. The Cowpasture River merges with the Jackson River about 3.0 miles downstream of Clifton Forge to form the James River. The Lick Run gage is just below this confluence. The data from the Cowpasture gage (flow frequencies and drainage area) was subtracted from the data provided by the Lick Run gage. The resulting values were projected to the discharge point using drainage area proportions.

James River at Lick Run, VA (#02016500):

Drainage Area = 1373 mi^2	(statistical period 1980 - 2003)	
Harmonic Mean = 745 cfs	High Flow 1Q10 = 325 cfs	7Q10 = 261 cfs
High Flow 30Q10 = 479 cfs	30Q5 = 315 cfs	1Q10 = 242 cfs
High Flow 7Q10 = 393 cfs	30Q10 = 286 cfs	1Q30 = 200 cfs

Cowpasture River near Clifton Forge, VA (#02016000):

Drainage Area = 461 mi^2	(statistical period 1925 - 2003)	
Harmonic Mean = 191 cfs	High Flow 1Q10 = 82 cfs	7Q10 = 56 cfs
High Flow 30Q10 = 124 cfs	30Q5 = 69 cfs	1Q10 = 53 cfs
High Flow 7Q10 = 92 cfs	30Q10 = 63 cfs	1Q30 = 47 cfs

James River minus the Cowpasture River:

Drainage Area = 912 mi^2		
Harmonic Mean = 554 cfs	High Flow 1Q10 = 243 cfs	7Q10 = 205 cfs
High Flow 30Q10 = 355 cfs	30Q5 = 246 cfs	1Q10 = 189 cfs
High Flow 7Q10 = 301 cfs	30Q10 = 223 cfs	1Q30 = 153 cfs

Jackson River at Clifton Forge WWTP: Drainage Area = 870 mi^2

Harmonic Mean = 528 cfs = 342 MGD	30Q10 = 213 cfs = 137 MGD
High Flow 30Q10 = 339 cfs = 219 MGD	7Q10 = 196 cfs = 126 MGD
High Flow 7Q10 = 287 cfs = 186 MGD	1Q10 = 180 cfs = 117 MGD
High Flow 1Q10 = 232 cfs = 150 MGD	1Q30 = 146 cfs = 94 MGD
30Q5 = 235 cfs = 152 MGD	

The high flow months are January through May.

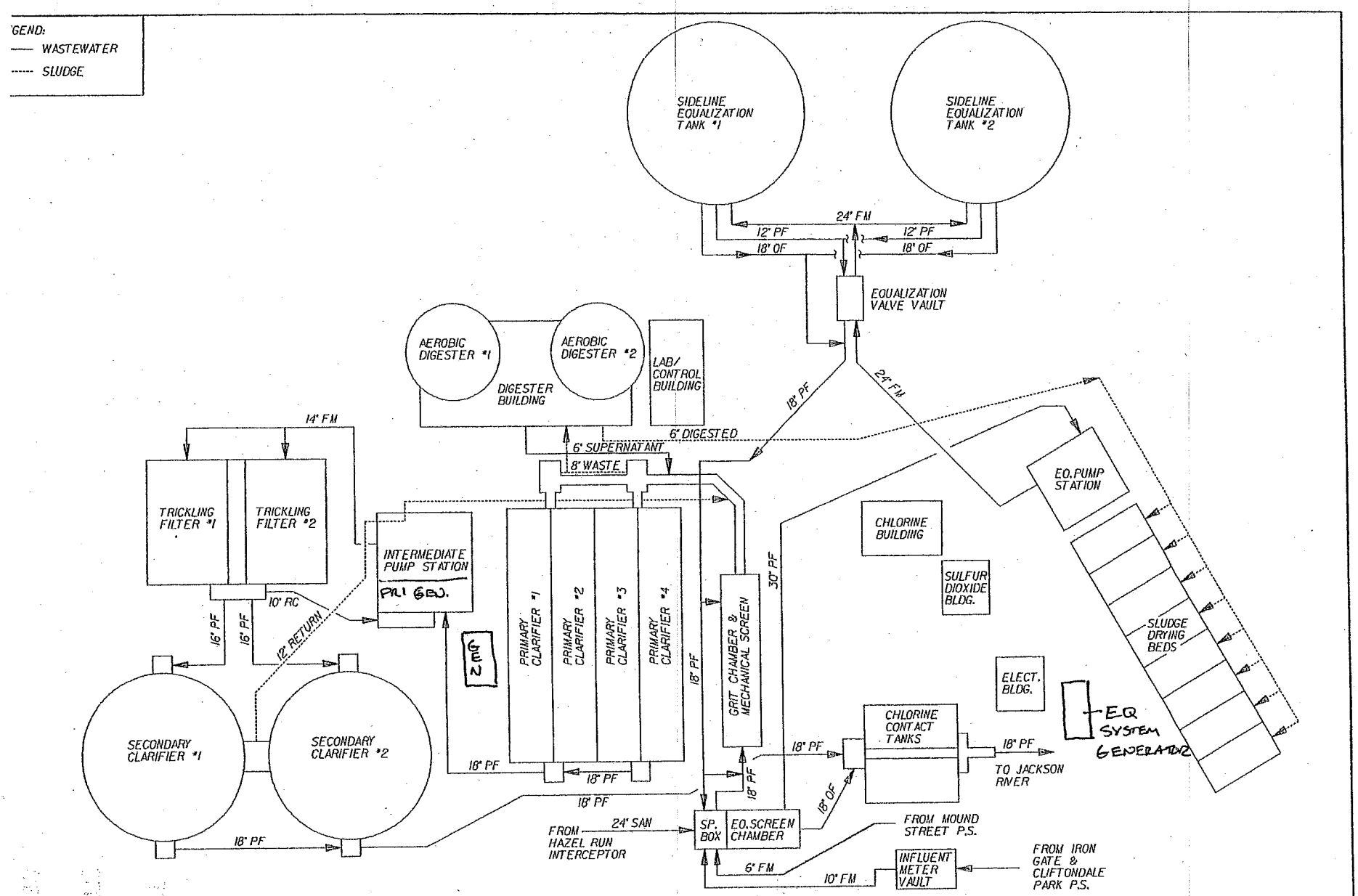
However, during the much shorter period of gage measurements between 1980 and 2003, there have been two summers during which the flows from Gathright Dam did not meet the minimum release rates scheduled under the Corps of Engineers Operating Plan. During these two summers water releases were reduced to provide a reservoir pool for downstream water supplies in the event that the drought continued. These two summer curtailments have a much greater influence on the minimum flow statistics of the Jackson River as they represent drought operation rather than what would be considered as design "low flow" conditions. It would not be expected that releases from Gathright would be curtailed once every 10 years.

In the Flow Frequency Memorandum of October 29, 1998, a similar approach to that taken above was used to establish flows at the Clifton Forge WWTP. However, the period of record for the James River gage at Lick Run included flows back to 1925 like that for the Cowpasture River gage. That flow determination proceeded as that above except that after determining the flows based on drainage area proportions at Clifton Forge WWTP the minimum release rates from Gathright Dam were added. In comparison, the high flow months were higher and the low flow months were lower:

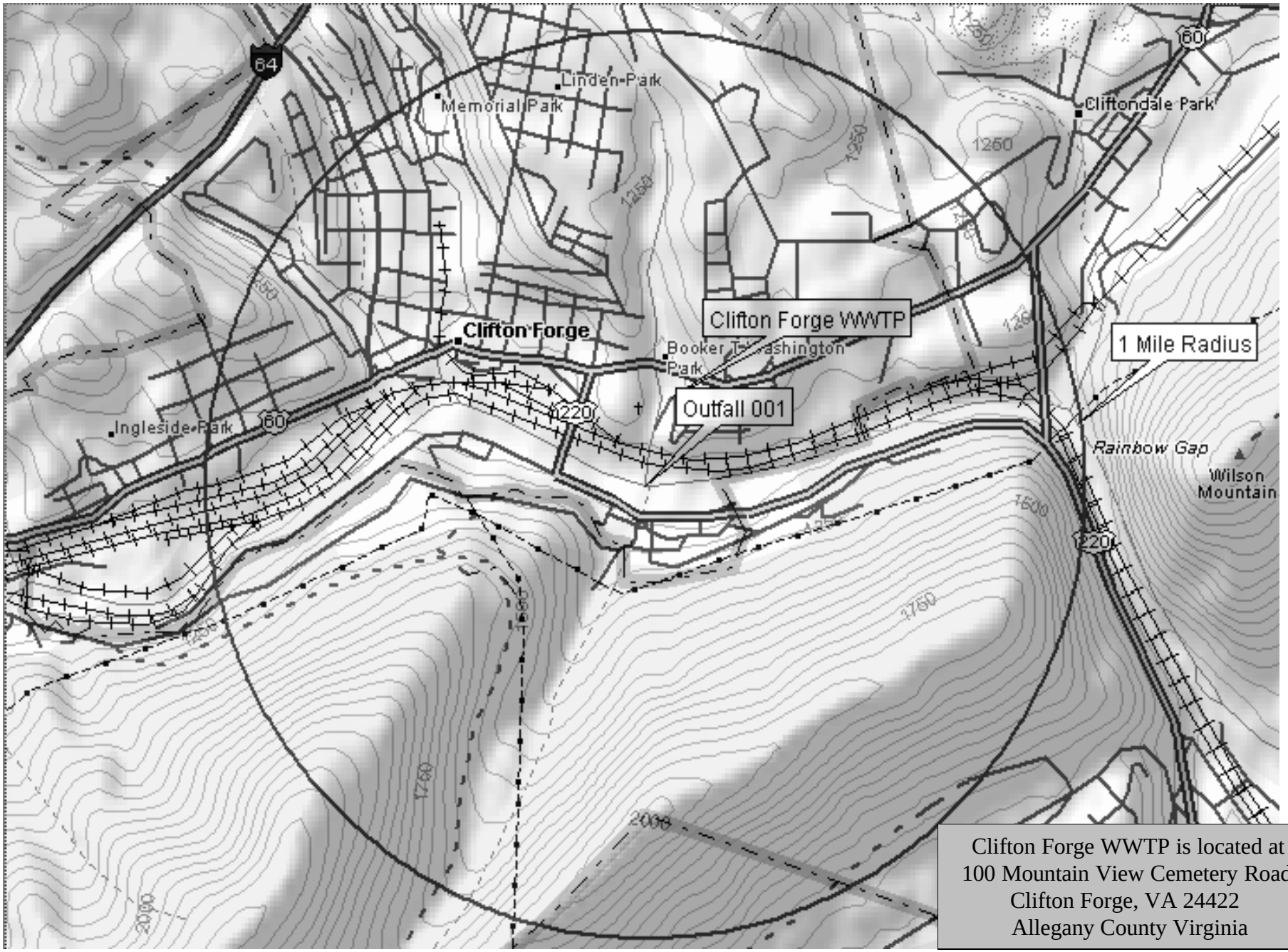
	1998	2001	difference	2003	1998-2003
Harmonic Mean	245 MGD	344 MGD	+ 99 MGD	342 MGD	+ 97 MGD
High Flow 30Q10	-	236 MGD		219 MGD	
High Flow 7Q10	148 MGD	197 MGD	+ 49 MGD	186 MGD	+ 38 MGD
High Flow 1Q10	143.5 MGD	156 MGD	+ 12.5 MGD	150 MGD	+ 6.5 MGD
Low Flow 30Q5	141.6 MGD	158 MGD	+ 16.4 MGD	152 MGD	+ 10.4 MGD
Low Flow 30Q10	-	142 MGD		137 MGD	
Low Flow 7Q10	137 MGD	131 MGD	- 6 MGD	126 MGD	- 11 MGD
Low Flow 1Q10	136.5 MGD	123 MGD	- 13.5 MGD	117 MGD	- 19.5 MGD
Low Flow 1Q30	-	-		94 MGD	

In light of this analysis, it is believed that retaining the flow frequencies of the **1998** memorandum is the most logical approach. In the future, the impact of two seasons of reduced flow during a drought will be buffered by a longer period of measure. For the flow values that were not included in the 1998 analysis the 2009 values are used in the limit development (HF 30Q10 and LF 30Q10).

This analysis assumes there are no significant discharges, withdrawals or springs influencing the flow between the gage and the discharge point.



WW ASSOCIATES — Engineers Surveyors Planners; 147 Mill Ridge Road, Lynchburg, Virginia 24502; Phone: 434.525.6155; Fax: 434.525.8179	DESIGNED BY: JAC	PROJECT: TOWN OF CLIFTON FORGE, VIRGINIA WASTEWATER TREATMENT PLANT O&M MANUAL - ADDENDUM #2			REVISION NUMBER: 0
	DRAWN BY: GAS	TITLE: PLANT FLOW DIAGRAM			FIGURE NUMBER: 1
	REVIEWED BY: JAC				
	WWA NUMBER: 20002915	FILE NAME: 2915C1.DGN	DISCIPLINE: CIVIL	SCALE: NOT TO SCALE	DATE: 6/11/02


64
60
Linden Park
Memorial Park
Cliftondale Park
1260
Clifton Forge WWTP
Clifton Forge
Booker T. Washington Park
1 Mile Radius
Outfall 001
220
Ingleside Park
Rainbow Gap
Wilson Mountain
1500
1760
2000
Clifton Forge WWTP is located at
100 Mountain View Cemetery Road
Clifton Forge, VA 24422
Allegany County Virginia

VIRGINIA DEQ NO EXPOSURE CERTIFICATION
FOR EXCLUSION FROM VPDES STORM WATER PERMITTING

RECEIVED
JUL 30 2009
DEQ – BRRO

Submission of this **No Exposure Certification** constitutes notice that the entity identified below does not require permit authorization for its storm water discharges associated with industrial activity under the VPDES Permit Program due to the existence of a condition of **No Exposure**.

A condition of **No Exposure** exists at an industrial facility when all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. A storm resistant shelter is not required for the following industrial materials and activities:

- drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak. "Sealed" means banded or otherwise secured and without operational taps or valves;
- adequately maintained vehicles used in material handling; and
- final products, other than products that would be mobilized in storm water discharges (e.g., rock salt).

A No Exposure Certification must be provided for each facility qualifying for the No Exposure exclusion. In addition, the exclusion from VPDES permitting is available on a facility-wide basis only, not for individual outfalls. If any industrial activities or materials are or will be exposed to precipitation, the facility is not eligible for the No Exposure exclusion.

By signing and submitting this No Exposure Certification form, the entity below is certifying that a condition of No Exposure exists at its facility or site, and is obligated to comply with the terms and conditions at 9 VAC 25-31-120 E (the VPDES Permit Regulation).

Please Type or Print All Information. ALL INFORMATION ON THIS FORM MUST BE PROVIDED.

1. **Facility Owner Information**

   Name: TOWN OF CLIFTON FORGE

   Mailing Address: P.O. Box 631

   City: CLIFTON FORGE State: VA Zip: 24422 Phone: (540) 863 2500

2. **Facility/Site Location Information**

   Facility Name: CLIFTON FORGE W/WTP

   Address: 100 MOUNTAIN VIEW CEMETERY ROAD

   City: CLIFTON FORGE State: VA Zip: 24422

   Latitude: 37° 48' 55" Longitude: 79° 48' 39"

3. **Was the facility or site previously covered under a VPDES storm water permit?** Yes ☒ No ☐

   If "Yes", enter the VPDES permit number: VA0022772

4. **SIC/Activity Codes:** Primary: 4592 Secondary (if applicable): N/A

5. **Total size of facility/site associated with industrial activity:** 10 acres

6. **Have you paved or roofed over a formerly exposed pervious area in order to qualify for the No Exposure exclusion?** Yes ☐ No ☒

   If "Yes", please indicate approximately how much area was paved or roofed. Completing this question does not disqualify you for the No Exposure exclusion. However, DEQ may use this information in considering whether storm water discharges from your site are likely to have an adverse impact on water quality, in which case you could be required to obtain permit coverage.

   Less than one acre ☐ One to five acres ☐ More than five acres ☐

7. Exposure Checklist

Are any of the following materials or activities exposed to precipitation, now or in the foreseeable future? (Please check either "Yes" or "No" in the appropriate box.) **If you answer "Yes" to any of these questions (1) through (11), you are <u>not</u> eligible for the No Exposure exclusion.**

		Yes	No
1.	Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment remain and are exposed to storm water	☐	☒
2.	Materials or residuals on the ground or in storm water inlets from spill/leaks	☐	☒
3.	Materials or products from past industrial activity	☐	☒
4.	Material handling equipment (except adequately maintained vehicles)	☐	☒
5.	Materials or products during loading/unloading or transporting activities	☐	☒
6.	Materials or products stored outdoors (except final products intended for outside use [e.g., new cars] where exposure to storm water does not result in the discharge of pollutants)	☐	☒
7.	Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers	☐	☒
8.	Materials or products handled/stored on roads or railways owned or maintained by the discharger	☐	☒
9.	Waste material (except waste in covered, non-leaking containers [e.g., dumpsters])	☐	☒
10.	Application or disposal of process wastewater (unless otherwise permitted)	☐	☒
11.	Particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated (i.e., under an air quality control permit) and evident in the storm water outflow	☐	☒

8. Certification Statement

I certify under penalty of law that I have read and understand the eligibility requirements for claiming a condition of no exposure and obtaining an exclusion from VPDES storm water permitting; and that there are no discharges of storm water contaminated by exposure to industrial activities or materials from the industrial facility identified in this document (except as allowed under 9 VAC 25-31-120 E 2).

I understand that I am obligated to submit a No Exposure Certification form once every five years to the Department of Environmental Quality and, if requested, to the operator of the local MS4 into which this facility discharges (where applicable). I understand that I must allow the Department, or MS4 operator where the discharge is into the local MS4, to perform inspections to confirm the condition of no exposure and to make such inspection reports publicly available upon request. I understand that I must obtain coverage under a VPDES permit prior to any point source discharge of storm water associated with industrial activity from the facility.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly involved in gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: Tracey D. Shiflett

Print Title: Town Manager

Signature: Tracey D Shiflett

Date: 7/28/09

For Department of Environmental Quality Use Only

Accepted/Not Accepted by: Susan R. Edwards Date: July 30, 2009

2008 Impaired Waters

Category 4 & 5 by 2008 Impaired Area ID*

James River Basin

Cause Group Code: **I09R-01-BEN** - **Jackson River**

Location:	Jackson River mainstem from the Westvaco main processing outfall downstream to the confluence of the Jackson and Cowpasture Rivers.
City/County	Alleghany Co., Covington City
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 5A

The original 1996 VAW-I04R and VAW-I09R impairments were combined into one in 2002.

2008 Assessment station locations are:
2-JKS000.38 - Rt. 727 Bridge - near Iron Gate (I09R)
2-JKS006.67 - Low Water Bridge - near Dabney Lancaster CC (I09R)
2-JKS013.29 - Off Rt. 696 above Lowmoor (I09R)
2-JKS018.68 - Rt. 18 Bridge at Covington (I09R)
2-JKS023.61 - City Park - Covington at gage (I09R)

General Standard (Benthic):
2-JKS023.61-Bio 'IM'; Seven Virginia Stream Condition Index (VSCI) surveys (2001 - 2006); lowest score spring 2001 31.03 and highest score 52.38 spring 2004. The spring 2006 score is 34.36. The invertebrate community at this site has been dominated by taxa that are tolerant of environments with low dissolved oxygen and high levels of organic pollution (i.e. Tubificidae, Planariidae, Chironomidae, and Simulidae). The VSCI scores display a negative alteration in the taxonomic diversity and pollution sensitivity of the benthic community. Elevated total phosphorus levels continue where 17 of 51 samples are above 0.20 mg/l - 'Observed Effect'. The maximum value is 1.40 mg/l and the lowest 0.23 mg/l. Trend analysis reveals a significant declining trend in total phosphorus.

2-JKS018.68- Bio 'IM'- Two VSCI scores from the fall of 2004 (67.3) and 2006 (51.8). The benthic community of the Jackson River shows some improvement at this station relative to the station at City Park (2-JKS023.61). However, the benthic community remains dominated by pollution tolerant taxa. 2008 TP results find no elevated TP levels above 0.20 mg/l from nine observations. The 2006 IR reported six of 18 observations greater than 0.20 mg/l. TP excursions ranged from 0.30 to 0.70 mg/l.

2-JKS013.29-Bio 'IM' Four VSCI survey scores result in a impaired condition with the lowest at 38.6 fall 2004 and the highest at 61.3 fall 2006. Lower VSCI scores are the result of the low taxonomic diversity and lack of pollution sensitive taxa. The 2006 sample showed an increase in pollution sensitive taxa and a decrease in pollution tolerant taxa. The Low Moor station has consistently had lower assessment scores and higher numbers of pollution tolerant organisms than at 2-JKS018.68. Elevated TP levels above 0.20 mg/l are found in six of 12 samples with excessive values ranging from 0.29 to 1.41 mg/l - 'Observed Effect'.

2-JKS006.67- 2-JKS006.67- Bio 'IM' Four VSCI surveys showing overall impairment with an average score of 52.8. There have been slight differences in scores over the six-year period. Spring scores have been lower than fall scores. Lower VSCI scores are the result of the decrease in pollution sensitive taxa. Elevated TP concentrations greater than 0.20 mg/l are found in eight of 21 observations ranging from 0.21 to 0.50 mg/l- 'Observed Effect'.

2-JKS000.38- Elevated TP observations greater than 0.20 mg/l are recorded in 15 of 50 observations - 'Observed Effect'. Values above 0.20 mg/l range from 0.22 to 1.24 mg/l. Trend analysis reveals significant declining trends in bacteria, total phosphorus and nitrogen.

The 1996 originally 303(d) Listed impairments to the benthic community are believed due to nutrient and organic enrichment (deposition) for 24.19 miles. Based on ambient station solids data, the nutrients and organics are mainly dissolved.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-I04R_JKS01A00	Jackson River Lower 1	Jackson River mainstem from the Westvaco main processing outfall downstream to Dunlap Creek mouth at the watershed boundary with I09R.	5A	Benthic-Macroinvertebrate Bioassessments	1996	2010	0.46
		Jackson River mainstem from					

VAW-I09R_JKS01A00	Jackson River Lower 1	the Clifton Forge STP outfall downstream to the Jackson River confluence with the Cowpasture River.	5A	Benthic-Macroinvertebrate Bioassessments	1996	2010	3.48
VAW-I09R_JKS02A00	Jackson River Lower 2	Jackson River mainstem from the US 60 crossing downstream to the Clifton Forge STP outfall.	5A	Benthic-Macroinvertebrate Bioassessments	1996	2010	1.71
VAW-I09R_JKS03A00	Jackson River Middle 1	Jackson River mainstem from upstream of the Lowmoor community downstream to the US 60 crossing.	5A	Benthic-Macroinvertebrate Bioassessments	1996	2010	7.81
VAW-I09R_JKS04A00	Jackson River Middle 2	Jackson River mainstem from the Covington STP outfall downstream to just above the Lowmoor community.	5A	Benthic-Macroinvertebrate Bioassessments	1996	2010	5.81
VAW-I09R_JKS05A00	Jackson River Upper 1	Jackson River mainstem from downstream of the Lexington Avenue Bridge to the City of Covington STP outfall on the Jackson River.	5A	Benthic-Macroinvertebrate Bioassessments	1996	2010	3.26
VAW-I09R_JKS06A00	Jackson River Upper 2	Jackson River mainstem from the watershed boundary (I04R) at the mouth of Dunlap Creek downstream to just below the Lexington Avenue Bridge.	5A	Benthic-Macroinvertebrate Bioassessments	1996	2010	1.66

Jackson River		**Estuary (sq. miles)**	**Reservoir (acres)**	**River (miles)**
Impaired area ID: VAW-I04R-01	Benthic-Macroinvertebrate Bioassessments / 5A Total impaired size by water type:			24.19

Aquatic Life

Sources:

- Industrial Point Source Discharge
- Municipal (Urbanized High Density Area)
- Municipal Point Source Discharges

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

M E M O R A N D U M
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
BLUE RIDGE REGIONAL OFFICE - Roanoke
WATER DIVISION

3019 Peters Creek Road **Roanoke, Virginia 24019-2738**

SUBJECT: Site visit for VPDES Permit Reissuance
Clifton Forge WWTP, Alleghany County

To: VPDES Permit file VA0022772

From: Susan K. Edwards, Environmental Engineer Sr.

Date: July 17, 2009

On Wednesday, July 15, 2009, the writer performed a site visit at the Clifton Forge WWTP. Brian White who is the plant manager and principal operator for the treatment plant was the guide for the visit through the plant. Mr. White works for Environmental Systems Services, Ltd., headquartered in Culpepper, Virginia, which is the current contract operator for the treatment plant.

Each component of the treatment works was observed, from the influent meter vault to the sludge drying beds. A train blocked access from the plant to the discharge on the banks of the Jackson River and therefore the outfall was not observed at the visit. The application package includes a narrative description and schematic of the treatment works and sludge handling of the Clifton Forge plant.

No large scale changes have been made to the treatment works since the last reissuance. I&I problems in the collection system are improving - seeing reduction in I&I to the plant. Two factors appear to be contributing to this improvement. The Town continues to pursue efforts to identify and eliminate I&I in the collection network under a Consent Order with DEQ. The other action enhancing the reduction of flows to the plant is that beginning in 2008 the Town started installing water meters to all water users. The project is expected to be completed in September 2009. Currently users are not charged for their water use but they are seeing their water use quantified for the first time. Water use has been dropping every month since meter installation began. Mr. White believes these two independent activities have resulted in lower flow to the plant.

There were no materials stored outside where they might impact stormwater at the site. All polymers for sludge thickening and soda ash are stored inside the sludge digester building. Chlorine tanks are stored inside the chlorine building. Sulfur dioxide tanks are stored inside the dechlorination building.

Previously Parker-Hannifin (formerly Acadia Polymers) was the only significant industrial contributor to the treatment plant's collection system. The Parker-Hannifin plant in Iron Gate has now closed and there are now no significant industrial contributor to the Clifton Forge WWTP. Pretreatment Program requirements will remain in the event that a new contributor will connect in the future.

The status of the construction on the Lower Jackson River wastewater treatment plant and subsequent conversion of the Clifton Forge WWTP to a pump station was discussed. Bids for LJRWWT are due August 6, 2009 and it is anticipated construction will begin in October or November 2009. That project is scheduled to be completed by January 2011 with full operation in April 2011. Conversion design work for the Clifton Forge WWTP is underway with design submittal by October 20, 2009, construction starting February 20, 2010 and construction completed by February 20, 2011.

The facility appeared in good condition and there were no areas in need attention observed during the site visit for permit reissuance.

Receiving Water Quality Data **STORET Station 2-JKS006.67**
Low Water Bridge near Dabney Lancaster Community College

Hardness (mg/l CaCO3)		pH (S.U.)		Temp (C)	
5/27/2003	81.8	5/27/2003	7.51	5/27/2003	14.79
3/25/2003	83.4	3/25/2003	8.43	3/25/2003	12.01
2/3/2003	183	2/3/2003	8.8	2/3/2003	8
11/18/2002	68.8	11/18/2002	8.19	11/18/2002	9.4
9/17/2002	200	9/17/2002	8.27	9/17/2002	23.45
7/18/2002	160	7/18/2002	7.7	7/18/2002	24.33
5/23/2002	137	5/23/2002	8.56	5/23/2002	18.39
3/26/2002	157	3/26/2002	7.53	3/26/2002	11.9
1/22/2002	217	1/22/2002	8.57	1/22/2002	7
11/28/2001	231	11/28/2001	8.28	11/28/2001	15.2
9/10/2001	138	9/10/2001	8.59	9/10/2001	23.9
7/19/2001	128	7/19/2001	8.2	7/19/2001	23.8
6/5/2001	134	6/5/2001	8.09	6/5/2001	20
5/1/2001	171.3	5/1/2001	8.89	5/1/2001	21.1
4/2/2001	58.7	4/2/2001	8.64	4/2/2001	7.7
3/1/2001	111	3/1/2001	9.05	3/1/2001	7.5
2/1/2001	133	2/1/2001	7.99	2/1/2001	6
1/9/2001	193	1/9/2001	8.41	1/9/2001	4.1
12/6/2000	234	12/6/2000	8.51	12/6/2000	4
11/2/2000	239	11/2/2000	8.59	11/2/2000	13
10/4/2000	137	10/4/2000	7.9	10/4/2000	20.3
9/7/2000	119	9/7/2000	8.01	9/7/2000	18.2
8/1/2000	130	8/1/2000	8.53	8/1/2000	24.5
7/10/2000	170	7/10/2000	7.96	7/10/2000	25.4
6/1/2000	102	6/1/2000	7.71	6/1/2000	19.4
5/15/2000	201	5/15/2000	7.98	5/15/2000	19.1
4/19/2000	51	4/19/2000	7.31	4/19/2000	11.8
3/28/2000	97	3/28/2000	7.39	3/28/2000	9.8
2/24/2000	94	2/24/2000	7.66	2/24/2000	8.5
1/13/2000	137	1/13/2000	7.39	1/13/2000	7.2
12/9/1999	219	12/9/1999	8.07	12/9/1999	7.5
9/28/1999	112	11/4/1999	8.1	11/4/1999	9.9
8/30/1999	189	10/22/1999	7.92	10/22/1999	10.8
7/28/1999	152	9/28/1999	7.75	9/28/1999	18.8
6/23/1999	196	8/30/1999	7.96	8/30/1999	21.2
5/3/1999	134	7/28/1999	7.79	7/28/1999	24.4
4/7/1999	70	6/23/1999	8	6/23/1999	21
3/18/1999	60	5/3/1999	8.1	5/3/1999	16.8
2/8/1999	128	4/7/1999	8.15	4/7/1999	15.4
1/13/1999	186	3/18/1999	8.04	3/18/1999	8.2
12/7/1998	264	2/8/1999	8.11	2/8/1999	8.5
11/16/1998	241	1/13/1999	7.62	1/13/1999	5.8
10/28/1998	186	12/7/1998	7.81	12/7/1998	13.9
9/21/1998	198	11/16/1998	7.9	11/16/1998	12.5
8/19/1998	153	10/28/1998	8.11	10/28/1998	14
7/16/1998	146	9/21/1998	7.87	9/21/1998	22.4
6/2/1998	110	8/19/1998	7.93	8/19/1998	22.4
5/14/1998	65.2	7/16/1998	8	7/16/1998	23.7
4/8/1998	82.7	6/2/1998	7.92	6/2/1998	21.2
3/3/1998	91.5	5/15/1998	7.83	5/15/1998	16.3
2/9/1998	68.5	4/8/1998	7.77	4/8/1998	12
1/5/1998	172	3/3/1998	8.06	3/3/1998	7.6
12/1/1997	256	2/9/1998	7.57	2/9/1998	5.5
11/3/1997	216	1/5/1998	7.85	1/5/1998	6.5

10/16/1997	262	12/1/1997	8.51	12/1/1997	12.2
9/3/1997	133	11/3/1997	7.9	11/3/1997	14.1
8/5/1997	155	10/16/1997	8.07	10/16/1997	15.4
7/28/1997	164	9/3/1997	8.03	9/3/1997	22.5
6/9/1997	101	8/5/1997	8.19	8/5/1997	22.1
5/12/1997	130	7/28/1997	8.15	7/28/1997	25.4
4/7/1997	113	6/9/1997	8.14	6/9/1997	17.4
3/12/1997	98	5/12/1997	8.2	5/12/1997	14.8
2/10/1997	87.7	4/7/1997	8.27	4/7/1997	13.8
1/6/1997	140	3/12/1997	8.21	3/12/1997	9.3
12/10/1996	85.9	2/10/1997	7.98	2/10/1997	5
11/4/1996	238	1/6/1997	8.09	1/6/1997	11.1
10/1/1996	197	12/10/1996	7.95	12/10/1996	6.1
9/9/1996	72	11/4/1996	7.98	11/4/1996	10.4
8/5/1996	180	9/9/1996	7.79	9/9/1996	19.7
7/9/1996	152	8/5/1996	8.07	8/5/1996	23.1
6/17/1996	64	7/9/1996	8.76	7/9/1996	24
5/20/1996	40	6/17/1996	8.06	6/17/1996	21.8
4/23/1996	160	5/20/1996	7.8	5/20/1996	11.6
3/27/1996	88	4/23/1996	7.73	4/23/1996	19.3
2/28/1996	90	3/27/1996	8.21	3/27/1996	8.5
1/18/1996	72	2/28/1996	7.88	2/28/1996	9.8
12/5/1995	145	1/18/1996	7.59	1/18/1996	6
10/3/1995	230	12/5/1995	7.83	12/5/1995	8.9
9/6/1995	196	11/1/1995	7.81	11/1/1995	15.3
8/3/1995	146	10/3/1995	7.87	10/3/1995	19.5
7/11/1995	147	9/6/1995	7.8	9/6/1995	21.7
6/27/1995	130	8/3/1995	7.5	8/3/1995	24.7
5/2/1995	120	7/11/1995	8.06	7/11/1995	24.3
4/4/1995	136	6/27/1995	7.45	6/27/1995	17.2
3/1/1995	92	5/2/1995	7.65	5/2/1995	14
2/9/1995	130	4/4/1995	8.11	4/4/1995	14.6
1/4/1995	266	3/1/1995	8.09	3/1/1995	9.1
12/6/1994	243	2/9/1995	7.72	2/9/1995	1.6
11/17/1994	224	1/4/1995	8.3	1/4/1995	4.6
10/26/1994	202	12/6/1994	8	12/6/1994	14.1
9/7/1994	174	11/17/1994	7.43	11/17/1994	12.4
8/8/1994	172	10/26/1994	8.04	10/26/1994	14.5
7/6/1994	160	9/7/1994	7.72	9/7/1994	20.9
6/28/1994	174	8/8/1994	7.93	8/8/1994	21.8
5/3/1994	90	7/6/1994	8.25	7/6/1994	26.5
4/5/1994	75	6/28/1994	8.26	6/28/1994	23.6
3/8/1994	51	5/3/1994	7.6	5/3/1994	15.3
2/7/1994	100	4/5/1994	8	4/5/1994	11.7
1/6/1994	138	3/8/1994	8	3/8/1994	9.9
12/6/1993	66	2/7/1994	8.3	2/7/1994	6.3
11/2/1993	188	1/6/1994	8.4	1/6/1994	4.5
10/18/1993	194	12/6/1993	8.4	12/6/1993	9
9/15/1993	174	11/2/1993	7.6	11/2/1993	8.5
8/10/1993	136	10/18/1993	7.9	10/18/1993	18.3
7/12/1993	116	9/15/1993	7.7	9/15/1993	21.4
6/8/1993	122	8/10/1993	7.9	7/12/1993	25.1
		7/12/1993	7.9	6/8/1993	22.5
		6/8/1993	8.19		

Mean hardness = 133.3
90th percentile pH = 8.51
90th percentile temp. = 23.8

VPDES Permit VA0022772
Clifton Forge WWTP
Reissuance September 2009

ATTACHMENT B

1. 3-year summary of effluent DMR data from - flow, pH, BOD_5, TSS & TRC
2. Memo summarizing WET data
3. Output from Agency Mixing Zone Analysis software evaluation.
4. Waste Load Allocation spreadsheet MSTRANTI draft k.
5. Agency STATS software output for analysis of ammonia, total residual chlorine, copper and zinc.

DMR Data Summary **Permit No: VA0022772**
Clifton Forge Waste Water Treatment Plant

	Flow (MGD)		pH (S.U.)		TSS				BOD5			
Due Date	Qty Avg.	Qty Max	Conc. Min.	Conc. Max.	Qty Avg.	Qty Max	Conc. Avg.	Conc. Max.	Qty Avg.	Qty Max	Conc. Avg.	Conc. Max.
10-May-2006	1.303	1.901	6.1	7	48	56	10	12	77	81	16	17
10-Jun-2006	1.031	1.419	6.1	7	57	62	15	16	62	69	16	18
10-Jul-2006	1.648	7.5	6.5	7.2	112	51	13	11	107	85	17	19
10-Aug-2006	1.28	2.456	6.9	7.5	35	46	8	8	74	84	16	17
10-Sep-2006	1.078	2.479	6.8	7.4	37	30	8	7	66	77	15	18
10-Oct-2006	1.254	1.937	6.4	7.1	39	50	8	9	62	67	13	15
10-Nov-2006	1.752	3.768	6.5	7	61	79	10	11	90	107	15	17
10-Dec-2006	1.752	4.344	6.5	7	76	108	11	13	105	130	16	19
10-Jan-2007	1.471	3.451	6.5	6.9	60	101	11	12	100	150	19	21
10-Feb-2007	1.947	3.841	6.4	6.7	81	116	11	11	114	150	16	17
10-Mar-2007	1.538	2.792	6.4	6.7	103	138	16	17	117	148	20	24
10-Apr-2007	2.102	4.765	6.4	6.7	74	81	10	9	104	113	14	16
10-May-2007	1.885	4.961	6.2	6.8	91	177	12	13	101	162	14	17
10-Jun-2007	1.147	1.904	6.2	6.8	52	50	12	13	64	61	15	15
10-Jul-2007	1.166	1.905	6.6	7.5	44	52	9	10	71	71	16	17
10-Aug-2007	1.095	1.983	7	7.4	40	54	9	11	89	104	21	24
10-Sep-2007	1.003	1.116	6.7	7.4	31	34	8	9	65	82	17	21
10-Oct-2007	1.097	2.036	6.6	7.3	34	38	8	9	58	62	14	15
10-Nov-2007	1.187	3.331	6.6	7.3	43	70	10	12	83	169	20	38
10-Dec-2007	1.07	1.866	6.4	7.1	40	43	10	12	66	71	17	19
10-Jan-2008	1.255	2.12	6.4	7	59	75	12	14	94	119	20	21
10-Feb-2008	1.305	1.802	6.3	7.5	58	62	12	13	89	99	19	20
10-Mar-2008	1.421	3.781	6.1	7.1	54	73	12	12	75	87	16	17
10-Apr-2008	1.613	3.102	6.2	6.9	89	145	14	18	99	115	16	17
10-May-2008	1.728	4.386	6.2	6.8	94	79	14	14	94	91	15	17
10-Jun-2008	1.58	2.798	6.2	7	56	97	13	17	66	103	16	19
10-Jul-2008	0.968	1.151	6.6	7.4	36	45	10	11	60	65	16	18
10-Aug-2008	0.967	1.565	6.5	7.3	39	48	10	12	80	101	21	26
10-Sep-2008	1.001	2.931	6.9	7.4	42	76	10	12	72	91	19	21
10-Oct-2008	1.012	1.858	6.9	7.3	30	30	8	9	57	54	15	15
10-Nov-2008	0.884	1.362	6.2	7.7	21	38	9	12	43	97	18	31
10-Dec-2008	0.994	1.819	6.1	7.8	28	46	8	11	52	68	14	17
10-Jan-2009	1.343	3.565	6	6.6	53	70	10	11	78	104	15	18
10-Feb-2009	1.459	3.204	6	6.6	92	128	15	19	106	140	18	22
10-Mar-2009	1.04	1.348	6	6.7	48	55	12	13	74	82	19	20
10-Apr-2009	1.336	2.484	6.1	6.9	65	107	12	14	87	125	17	19
Permit Limit	**[2.0]**	**NL**	**6.0**	**9.0**	**227**	**340**	**30**	**45**	**227**	**340**	**30**	**45**

MEMORANDUM
DEPARTMENT OF ENVIRONMENTAL QUALITY
BLUE RIDGE REGIONAL OFFICE - ROANOKE
Water Permits Division

3019 Peters Creek Road Roanoke, VA 24019-2738

SUBJECT: Data Review for Town of Clifton Forge Waste Water Treatment Plant (VA0022772)
Summary of results after 2004 VPDES permit reissuance

TO: Permit reissuance fact sheet

FROM: Susan K. Edwards, Environmental Engineer Sr.

DATE: January 8, 2009

DISCUSSION

The VPDES permit for the Town of Clifton Forge's Wastewater Treatment Plant was last reissued on Sept. 14, 2004. The TMP of the 2004 permit requires annual acute and chronic testing of the effluent of outfall 001 using *Pimephales promelas* (fathead minnow) as the most sensitive species. The acute test is a 48-hour static test; the chronic test is a 7-day larval survival and growth test. There have been Five test events since the reissuance. The testing lab was Coastal Bioanalysts, Inc.

The audit of the testing report determined the test is valid with no deficiencies from procedures noted.

RECOMMENDATIONS

Testing should continue per the permit on an annual basis with permit reissuance expected in September 2009.

DATA SUMMARY TABLE

Event	Date	Test Organism	48-hr LC_{50}	NOEC S/G	T.U.	Survival in 100% Effluent
1st A	10/13-15/04	*Pimephales promelas*	> 100%		< 1.0	100%
	10/12-19/04	*Pimephales promelas*		100%	< 1.0	83%
2nd A	10/26-28/05	*Pimephales promelas*	> 100%		< 1.0	100%
	10/25-11/1/05	*Pimephales promelas*		100/51%	< 1.0	85%
3rd A	10/25-27/06	*Pimephales promelas*	> 100%		< 1.0	100%
	10/30-11/7/06	*Pimephales promelas*		51/51%	< 1.0	85%
4th A	10/31-11/2/07	*Pimephales promelas*	> 100%		<1.0	100%
	10/30-11/6/07	*Pimephales promelas*		100/52%	<1.0	95%
5th A	10/29-31/08	*Pimephales promelas*	>100%		<1.0	100%
	10/28-11/4/08	*Pimephales promelas*		100/52%	<1.0	98%

Virginia DEQ Mixing Zone Analysis - Version 2.1.0

Mixing Zone Predictions for Clifton Forge WWTP

Effluent Flow = 2.0 MGD
Stream 7Q10 = 137 MGD
Stream 30Q10 = 137 MGD
Stream 1Q10 = 136.5 MGD
Stream slope = .0022 ft/ft
Stream width = 185 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 1.4463 ft
Length = 23781.11 ft
Velocity = .8042 ft/sec
Residence Time = .3423 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 1.4463 ft
Length = 23781.11 ft
Velocity = .8042 ft/sec
Residence Time = .3423 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 1.4431 ft
Length = 23824.82 ft
Velocity = .803 ft/sec
Residence Time = 8.2413 hours

Recommendation: A complete mix assumption is appropriate for this situation providing no more than 12.13% of the 1Q10 is used.

Mixing Zone Predictions for Clifton Forge WWTP - high flow values

Effluent Flow = 2.0 MGD
Stream HF 30Q10 = 219 MGD
Stream HF 1Q10 = 137 MGD
Stream slope = .0022 ft/ft
Stream width = 220 ft
Bottom scale = 4
Channel scale = 1

Mixing Zone Predictions @ HF 30Q10

Depth = 1.9916 ft
Length = 20207.37 ft
Velocity = .7808 ft/sec
Residence Time = .2995 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire HF 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 1.5053 ft
Length = 25591.16 ft
Velocity = .6497 ft/sec
Residence Time = 10.9406 hours

Recommendation: A complete mix assumption is appropriate for this situation providing no more than 9.14% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Clifton Forge WWTP Permit No.: VA0022772

Receiving Stream: Jackson River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		
Mean Hardness (as CaCO3) =	133.3	mg/L
90% Temperature (Annual) =	23.8	deg C
90% Temperature (Wet season) =		deg C
90% Maximum pH =	8.5	SU
10% Maximum pH =		SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	n	

Stream Flows		
1Q10 (Annual) =	136.5	MGD
7Q10 (Annual) =	137	MGD
30Q10 (Annual) =	137	MGD
1Q10 (Wet season) =	143.5	MGD
30Q10 (Wet season)	219	MGD
30Q5 =	141.6	MGD
Harmonic Mean =	245	MGD
Annual Average =	N/A	MGD

Mixing Information		
Annual - 1Q10 Mix =	12.13	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	9.14	%
- 30Q10 Mix =	100	%

Effluent Information		
Mean Hardness (as CaCO3) =	106.55	mg/L
90% Temp (Annual) =	21.5	deg C
90% Temp (Wet season) =	15.7	deg C
90% Maximum pH =	7.09	SU
10% Maximum pH =	6.7	SU
Discharge Flow =	2	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	na	2.7E+03	--	--	na	1.9E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.9E+05**
Acrolein	0	--	--	na	7.8E+02	--	--	na	5.6E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.6E+04**
Acrylonitrile [C]	0	--	--	na	6.6E+00	--	--	na	8.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.2E+02**
Aldrin [C]	0	3.0E+00	--	na	1.4E-03	2.8E+01	--	na	1.7E-01	--	--	--	--	--	--	--	--	**2.8E+01**	**--**	**na**	**1.7E-01**
Ammonia-N (mg/l) (Yearly)	0	9.47E+00	7.50E-01	na	--	8.8E+01	5.2E+01	na	--	--	--	--	--	--	--	--	--	**8.8E+01**	**5.2E+01**	**na**	**--**
Ammonia-N (mg/l) (High Flow)	0	1.07E+01	2.05E+00	na	--	8.1E+01	2.3E+02	na	--	--	--	--	--	--	--	--	--	**8.1E+01**	**2.3E+02**	**na**	**--**
Anthracene	0	--	--	na	1.1E+05	--	--	na	7.9E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.9E+06**
Antimony	0	--	--	na	4.3E+03	--	--	na	3.1E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.1E+05**
Arsenic	o	3.4E+02	1.5E+02	na	--	3.2E+03	1.0E+04	na	--	--	--	--	--	--	--	--	--	**3.2E+03**	**1.0E+04**	**na**	**--**
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Benzene [C]	0	--	--	na	7.1E+02	--	--	na	8.8E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.8E+04**
Benzidine [C]	0	--	--	na	5.4E-03	--	--	na	6.7E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.7E-01**
Benzo (a) anthracene [C]	0	--	--	na	4.9E-01	--	--	na	6.1E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.1E+01**
Benzo (b) fluoranthene [C]	0	--	--	na	4.9E-01	--	--	na	6.1E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.1E+01**
Benzo (k) fluoranthene [C]	0	--	--	na	4.9E-01	--	--	na	6.1E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.1E+01**
Benzo (a) pyrene [C]	0	--	--	na	4.9E-01	--	--	na	6.1E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.1E+01**
Bis2-Chloroethyl Ether	0	--	--	na	1.4E+01	--	--	na	1.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+03**
Bis2-Chloroisopropyl Ether	0	--	--	na	1.7E+05	--	--	na	1.2E+07	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+07**
Bromoform [C]	0	--	--	na	3.6E+03	--	--	na	4.4E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.4E+05**
Butylbenzylphthalate	0	--	--	na	5.2E+03	--	--	na	3.7E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.7E+05**
Cadmium	0	5.3E+00	1.4E+00	na	--	4.9E+01	9.9E+01	na	--	--	--	--	--	--	--	--	--	**4.9E+01**	**9.9E+01**	**na**	**--**
Carbon Tetrachloride [C]	0	--	--	na	4.4E+01	--	--	na	5.4E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.4E+03**
Chlordane [C]	0	2.4E+00	4.3E-03	na	2.2E-02	2.2E+01	3.0E-01	na	2.7E+00	--	--	--	--	--	--	--	--	**2.2E+01**	**3.0E-01**	**na**	**2.7E+00**
Chloride	0	8.6E+05	2.3E+05	na	--	8.0E+06	1.6E+07	na	--	--	--	--	--	--	--	--	--	**8.0E+06**	**1.6E+07**	**na**	**--**
TRC	0	1.9E+01	1.1E+01	na	--	1.8E+02	7.6E+02	na	--	--	--	--	--	--	--	--	--	**1.8E+02**	**7.6E+02**	**na**	**--**
Chlorobenzene	0	--	--	na	2.1E+04	--	--	na	1.5E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+06**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	3.4E+02	--	--	na	4.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.2E+04**
Chloroform [C]	0	--	--	na	2.9E+04	--	--	na	3.6E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.6E+06**
2-Chloronaphthalene	0	--	--	na	4.3E+03	--	--	na	3.1E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.1E+05**
2-Chlorophenol	0	--	--	na	4.0E+02	--	--	na	2.9E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.9E+04**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	7.7E-01	2.8E+00	na	--	--	--	--	--	--	--	--	--	**7.7E-01**	**2.8E+00**	**na**	**--**
Chromium III	0	7.1E+02	9.4E+01	na	--	6.6E+03	6.5E+03	na	--	--	--	--	--	--	--	--	--	**6.6E+03**	**6.5E+03**	**na**	**--**
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.5E+02	7.6E+02	na	--	--	--	--	--	--	--	--	--	**1.5E+02**	**7.6E+02**	**na**	**--**
Chromium, Total	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Chrysene [C]	0	--	--	na	4.9E-01	--	--	na	6.1E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.1E+01**
Copper	0	1.7E+01	1.1E+01	na	--	1.6E+02	7.9E+02	na	--	--	--	--	--	--	--	--	--	**1.6E+02**	**7.9E+02**	**na**	**--**
Cyanide	0	2.2E+01	5.2E+00	na	2.2E+05	2.0E+02	3.6E+02	na	1.5E+07	--	--	--	--	--	--	--	--	**2.0E+02**	**3.6E+02**	**na**	**1.5E+07**
DDD [C]	0	--	--	na	8.4E-03	--	--	na	1.0E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+00**
DDE [C]	0	--	--	na	5.9E-03	--	--	na	7.3E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.3E-01**
DDT [C]	0	1.1E+00	1.0E-03	na	5.9E-03	1.0E+01	7.0E-02	na	7.3E-01	--	--	--	--	--	--	--	--	**1.0E+01**	**7.0E-02**	**na**	**7.3E-01**
Demeton	0	--	1.0E-01	na	--	--	7.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**7.0E+00**	**na**	**--**
Dibenz(a,h)anthracene [C]	0	--	--	na	4.9E-01	--	--	na	6.1E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.1E+01**
Dibutyl phthalate	0	--	--	na	1.2E+04	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.6E+05**
Dichloromethane (Methylene Chloride) [C]	0	--	--	na	1.6E+04	--	--	na	2.0E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+06**
1,2-Dichlorobenzene	0	--	--	na	1.7E+04	--	--	na	1.2E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+06**
1,3-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	1.9E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.9E+05**
1,4-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	1.9E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.9E+05**
3,3-Dichlorobenzidine[C]	0	--	--	na	7.7E-01	--	--	na	9.5E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.5E+01**
Dichlorobromomethane [C]	0	--	--	na	4.6E+02	--	--	na	5.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E+04**
1,2-Dichloroethane [C]	0	--	--	na	9.9E+02	--	--	na	1.2E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+05**
1,1-Dichloroethylene	0	--	--	na	1.7E+04	--	--	na	1.2E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+06**
1,2-trans-dichloroethylene	0	--	--	na	1.4E+05	--	--	na	1.0E+07	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+07**
2,4-Dichlorophenol	0	--	--	na	7.9E+02	--	--	na	5.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E+04**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,2-Dichloropropane[C]	0	--	--	na	3.9E+02	--	--	na	4.8E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.8E+04**
1,3-Dichloropropene	0	--	--	na	1.7E+03	--	--	na	1.2E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+05**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	1.4E-03	2.2E+00	3.9E+00	na	1.7E-01	--	--	--	--	--	--	--	--	**2.2E+00**	**3.9E+00**	**na**	**1.7E-01**
Diethyl Phthalate	0	--	--	na	1.2E+05	--	--	na	8.6E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.6E+06**
Di-2-Ethylhexyl Phthalate [C]	0	--	--	na	5.9E+01	--	--	na	7.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.3E+03**
2,4-Dimethylphenol	0	--	--	na	2.3E+03	--	--	na	1.7E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+05**
Dimethyl Phthalate	0	--	--	na	2.9E+06	--	--	na	2.1E+08	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.1E+08**
Di-n-Butyl Phthalate	0	--	--	na	1.2E+04	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.6E+05**
2,4 Dinitrophenol	0	--	--	na	1.4E+04	--	--	na	1.0E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+06**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	7.65E+02	--	--	na	5.5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.5E+04**
2,4-Dinitrotoluene [C]	0	--	--	na	9.1E+01	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+04**
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	--	--	na	1.2E-06	--	--	na	na	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**na**
1,2-Diphenylhydrazine[C]	0	--	--	na	5.4E+00	--	--	na	6.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.7E+02**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.0E+00	3.9E+00	na	1.7E+04	--	--	--	--	--	--	--	--	**2.0E+00**	**3.9E+00**	**na**	**1.7E+04**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.0E+00	3.9E+00	na	1.7E+04	--	--	--	--	--	--	--	--	**2.0E+00**	**3.9E+00**	**na**	**1.7E+04**
Endosulfan Sulfate	0	--	--	na	2.4E+02	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+04**
Endrin	0	8.6E-02	3.6E-02	na	8.1E-01	8.0E-01	2.5E+00	na	5.8E+01	--	--	--	--	--	--	--	--	**8.0E-01**	**2.5E+00**	**na**	**5.8E+01**
Endrin Aldehyde	0	--	--	na	8.1E-01	--	--	na	5.8E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.8E+01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	na	2.9E+04	--	--	na	2.1E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.1E+06**
Fluoranthene	0	--	--	na	3.7E+02	--	--	na	2.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.7E+04**
Fluorene	0	--	--	na	1.4E+04	--	--	na	1.0E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+06**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Guthion	0	--	1.0E-02	na	--	--	7.0E-01	na	--	--	--	--	--	--	--	--	--	**--**	**7.0E-01**	**na**	**--**
Heptachlor [C]	0	5.2E-01	3.8E-03	na	2.1E-03	4.8E+00	2.6E-01	na	2.6E-01	--	--	--	--	--	--	--	--	**4.8E+00**	**2.6E-01**	**na**	**2.6E-01**
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	1.1E-03	4.8E+00	2.6E-01	na	1.4E-01	--	--	--	--	--	--	--	--	**4.8E+00**	**2.6E-01**	**na**	**1.4E-01**
Hexachlorobenzene[C]	0	--	--	na	7.7E-03	--	--	na	9.5E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.5E-01**
Hexachlorobutadiene[C]	0	--	--	na	5.0E+02	--	--	na	6.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.2E+04**
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	1.3E-01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+01**
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	4.6E-01	--	--	na	5.7E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E+01**
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	6.3E-01	8.8E+00	--	na	7.8E+01	--	--	--	--	--	--	--	--	**8.8E+00**	**--**	**na**	**7.8E+01**
Hexachlorocyclopentadiene	0	--	--	na	1.7E+04	--	--	na	1.2E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+06**
Hexachloroethane[C]	0	--	--	na	8.9E+01	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+04**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	1.4E+02	na	--	--	--	--	--	--	--	--	--	**--**	**1.4E+02**	**na**	**--**
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	4.9E-01	--	--	na	6.1E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.1E+01**
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Isophorone[C]	0	--	--	na	2.6E+04	--	--	na	3.2E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.2E+06**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**na**	**--**
Lead	0	1.7E+02	1.9E+01	na	--	1.5E+03	1.3E+03	na	--	--	--	--	--	--	--	--	--	**1.5E+03**	**1.3E+03**	**na**	**--**
Malathion	0	--	1.0E-01	na	--	--	7.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**7.0E+00**	**na**	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Mercury	0	1.4E+00	7.7E-01	na	5.1E-02	1.3E+01	5.4E+01	na	3.7E+00	--	--	--	--	--	--	--	--	**1.3E+01**	**5.4E+01**	**na**	**3.7E+00**
Methyl Bromide	0	--	--	na	4.0E+03	--	--	na	2.9E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.9E+05**
Methoxychlor	0	--	3.0E-02	na	--	--	2.1E+00	na	--	--	--	--	--	--	--	--	--	**--**	**2.1E+00**	**na**	**--**
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	**--**	**0.0E+00**	**na**	**--**
Monochlorobenzene	0	--	--	na	2.1E+04	--	--	na	1.5E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+06**
Nickel	0	2.3E+02	2.6E+01	na	4.6E+03	2.1E+03	1.8E+03	na	3.3E+05	--	--	--	--	--	--	--	--	**2.1E+03**	**1.8E+03**	**na**	**3.3E+05**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Nitrobenzene	0	--	--	na	1.9E+03	--	--	na	1.4E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+05**
N-Nitrosodimethylamine[C]	0	--	--	na	8.1E+01	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+04**
N-Nitrosodiphenylamine[C]	0	--	--	na	1.6E+02	--	--	na	2.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+04**
N-Nitrosodi-n-propylamine[C]	0	--	--	na	1.4E+01	--	--	na	1.7E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+03**
Parathion	0	6.5E-02	1.3E-02	na	--	6.0E-01	9.0E-01	na	--	--	--	--	--	--	--	--	--	**6.0E-01**	**9.0E-01**	**na**	**--**
PCB-1016	0	--	1.4E-02	na	--	--	9.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**9.7E-01**	**na**	**--**
PCB-1221	0	--	1.4E-02	na	--	--	9.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**9.7E-01**	**na**	**--**
PCB-1232	0	--	1.4E-02	na	--	--	9.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**9.7E-01**	**na**	**--**
PCB-1242	0	--	1.4E-02	na	--	--	9.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**9.7E-01**	**na**	**--**
PCB-1248	0	--	1.4E-02	na	--	--	9.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**9.7E-01**	**na**	**--**
PCB-1254	0	--	1.4E-02	na	--	--	9.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**9.7E-01**	**na**	**--**
PCB-1260	0	--	1.4E-02	na	--	--	9.7E-01	na	--	--	--	--	--	--	--	--	--	**--**	**9.7E-01**	**na**	**--**
PCB Total[C]	0	--	--	na	1.7E-03	--	--	na	2.1E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.1E-01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Pentachlorophenol [C]	0	8.1E-03	5.9E-03	na	8.2E+01	7.5E-02	4.1E-01	na	1.0E+04	--	--	--	--	--	--	--	--	**7.5E-02**	**4.1E-01**	**na**	**1.0E+04**
Phenol	0	--	--	na	4.6E+06	--	--	na	3.3E+08	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+08**
Pyrene	0	--	--	na	1.1E+04	--	--	na	7.9E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.9E+05**
Radionuclides (pCi/l except Beta/Photon)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Gross Alpha Activity	0	--	--	na	1.5E+01	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+03**
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	2.9E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.9E+02**
Strontium-90	0	--	--	na	8.0E+00	--	--	na	5.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.7E+02**
Tritium	0	--	--	na	2.0E+04	--	--	na	1.4E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+06**
Selenium	0	2.0E+01	5.0E+00	na	1.1E+04	1.9E+02	3.5E+02	na	7.9E+05	--	--	--	--	--	--	--	--	**1.9E+02**	**3.5E+02**	**na**	**7.9E+05**
Silver	0	5.4E+00	--	na	--	5.1E+01	--	na	--	--	--	--	--	--	--	--	--	**5.1E+01**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	1.1E+02	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+04**
Tetrachloroethylene[C]	0	--	--	na	8.9E+01	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+04**
Thallium	0	--	--	na	6.3E+00	--	--	na	4.5E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.5E+02**
Toluene	0	--	--	na	2.0E+05	--	--	na	1.4E+07	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+07**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	7.5E-03	6.8E+00	1.4E-02	na	9.3E-01	--	--	--	--	--	--	--	--	**6.8E+00**	**1.4E-02**	**na**	**9.3E-01**
Tributyltin	0	4.6E-01	6.3E-02	na	--	4.3E+00	4.4E+00	na	--	--	--	--	--	--	--	--	--	**4.3E+00**	**4.4E+00**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	9.4E+02	--	--	na	6.7E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.7E+04**
1,1,2-Trichloroethane[C]	0	--	--	na	4.2E+02	--	--	na	5.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.2E+04**
Trichloroethylene [C]	0	--	--	na	8.1E+02	--	--	na	1.0E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+05**
2,4,6-Trichlorophenol [C]	0	--	--	na	6.5E+01	--	--	na	8.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.0E+03**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	6.1E+01	--	--	na	7.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.5E+03**
Zinc	0	1.5E+02	1.5E+02	na	6.9E+04	1.4E+03	1.0E+04	na	5.0E+06	--	--	--	--	--	--	--	--	**1.4E+03**	**1.0E+04**	**na**	**5.0E+06**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens,
   Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)
Antimony	3.1E+05
Arsenic	1.3E+03
Barium	na
Cadmium	2.0E+01
Chromium III	2.6E+03
Chromium VI	5.9E+01
Copper	6.4E+01
Iron	na
Lead	6.2E+02
Manganese	na
Mercury	3.7E+00
Nickel	8.5E+02
Selenium	7.4E+01
Silver	2.0E+01
Zinc	5.4E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

STATS output file results - Ammonia

Facility = Clifton Forge WWTP
Chemical = ammonia
Chronic averaging period = 30
WLAa = 88
WLAc = 52
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:
observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:
9

STATS output file results - Total Residual Chlorine

Facility = Clifton Forge WWTP
Chemical = Total Residual Chlorine
Chronic averaging period = 4
WLAa = 180
WLAc = 760
Q.L. = 100
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:
observations = 1
Expected Value = 20000
Variance = 1440000
C.V. = 0.6
97th percentile daily values = 48668.3
97th percentile 4 day average = 33275.8
97th percentile 30 day average= 24121.0
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 180 (n/a only applies to industrial dischargers)
Average Weekly Limit = 107.3709154624
Average Monthly Limit = 89.2118094961822

The data are:
20000

STATS output file results - Copper total recoverable

Facility = Clifton Forge WWTP
Chemical = Copper total recoverable
Chronic averaging period = 4
WLAa = 160
WLAc = 790
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:
observations = 2
Expected Value = 9.5
Variance = 32.49
C.V. = 0.6
97th percentile daily values = 23.1174
97th percentile 4 day average = 15.8060
97th percentile 30 day average= 11.4575
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:
8
11

STATS output file results - Zinc total recoverable

Facility = Clifton Forge WWTP
Chemical = Zinc total recoverable
Chronic averaging period = 4
WLAa = 1400
WLAc = 10000
Q.L. = 5
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:
observations = 2
Expected Value = 25.5
Variance = 234.09
C.V. = 0.6
97th percentile daily values = 62.0521
97th percentile 4 day average = 42.4266
97th percentile 30 day average= 30.7543
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:
23
28

VPDES Permit VA0022772
Clifton Forge WWTP
Reissuance September 2009

EPA Review Checklist

Revised 2/2003

State "FY2003 Transmittal Checklist" to Assist in Targeting Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name: **Clifton Forge WWTP**

NPDES Permit Number: **VA0022772**

Permit Writer Name: Susan K. Edwards

Date: July 29, 2009

Major [**X**] **Minor** [ ] **Industrial** [ ] **Municipal** [**X**]

I.A. Draft Permit Package Submittal Includes:	**Yes**	**No**	**N/A**
1. Permit Application?	**x**		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	**x**		
3. Copy of Public Notice?		**x**	
4. Complete Fact Sheet?	**x**		
5. A Priority Pollutant Screening to determine parameters of concern?	**x**		
6. A Reasonable Potential analysis showing calculated WQBELs?	**x**		
7. Dissolved Oxygen calculations?		**x**	
8. Whole Effluent Toxicity Test summary and analysis?	**x**		
9. Permit Rating Sheet for new or modified industrial facilities?			**x**

I.B. Permit/Facility Characteristics	**Yes**	**No**	**N/A**
1. Is this a new, or currently unpermitted facility?		**x**	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	**x**		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	**x**		

I.B. Permit/Facility Characteristics – cont. (FY2003)	Yes	No	N/A
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		x	
5. Has there been any change in streamflow characteristics since the last permit was developed?		x	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		x	
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	x		
8. Does the facility discharge to a 303(d) listed water?	x		
a. Has a TMDL been developed and approved by EPA for the impaired water?		x	
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit? (2010)	x		
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	x		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		x	
10. Does the permit authorize discharges of storm water? No exposure certificate.	x		
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		x	
12. Are there any production-based, technology-based effluent limits in the permit?	x		
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		x	
14. Are any WQBELs based on an interpretation of narrative criteria?		x	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		x	
16. Does the permit contain a compliance schedule for any limit or condition?		x	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		x	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	x		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		x	
20. Have previous permit, application, and fact sheet been examined?	x		

Part II. NPDES Draft Permit Checklist (FY2003)

Region III NPDES Permit Quality Checklist – for POTWs

(To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	x		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	x		

II.B. Effluent Limits – General Elements	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	x		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	x		

II.C. Technology-Based Effluent Limits (POTWs)	Yes	No	N/A
1. Does the permit contain numeric limits for ALL of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	x		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	x		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			x
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	x		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	x		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		x	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			x

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	x		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?			x

II.D. Water Quality-Based Effluent Limits – cont. (FY2003)	Yes	No	N/A
3. Does the fact sheet provide effluent characteristics for each outfall?	x		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	x		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	x		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	x		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	x		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?			x
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	x		
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	x		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	x		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	x		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	x		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	x		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			x
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	x		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		x	
4. Does the permit require testing for Whole Effluent Toxicity?	x		

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	x		
2. Does the permit include appropriate storm water program requirements?	x		

II.F. Special Conditions – cont. (FY2003)	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			x
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	x		
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		x	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		x	
a. Does the permit require implementation of the "Nine Minimum Controls"?			x
b. Does the permit require development and implementation of a "Long Term Control Plan"?			x
c. Does the permit require monitoring and reporting for CSO events?			x
7. Does the permit include appropriate Pretreatment Program requirements?	x		

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	x		

List of Standard Conditions – 40 CFR 122.41

Duty to comply
Duty to reapply
Need to halt or reduce activity not a defense
Duty to mitigate
Proper O & M
Permit actions

Property rights
Duty to provide information
Inspections and entry
Monitoring and records
Signatory requirement
Bypass
Upset

Reporting Requirements
- Planned change
- Anticipated noncompliance
- Transfers
- Monitoring reports
- Compliance schedules
- 24-Hour reporting
- Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	x		

Part III. Signature Page (FY2003)

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	**Susan K. Edwards**
Title	**Environmental Engineer Senior**
Signature	
Date	**July 29, 2009**